Fusarium oxysporium and *Verticillium albo-atrum*. In order to determine the degree of transmission of these wilts through seed tubers, McKAY[8] has carried on experiments with numerous varieties of potatoes for four years. *Verticillium albo-atrum* occurs somewhat more extensively in small tubers than in medium-sized ones, 30–50 per cent of the crop grown from infected seed tubers being diseased with *Verticillium* wilt, as shown by cultures. *Fusarium oxysporium* is transmitted in a lesser degree, and it appears to be capable of remaining virulent in the soil for several years after the production of a crop of potatoes. Vascular discoloration is an unreliable index of *Verticillium* infection, since approximately 7–17 per cent of cultured tubers which produced the fungus show no discoloration, and 55 per cent of the tubers which show brown vascular discoloration give no organism parasitic for the potato. Although the discoloration occurs at the stem end of the tuber, stem-end seed pieces give no more disease than eye-end pieces of the same infected tuber. Numerous species of *Fusarium* and other fungi mostly saprophytic in nature appear in cultures of wilt diseased tubers.—J. G. BROWN.

Colloidal hydration.—In two recent papers MACDOUGAL[9, 10] discusses the effects of bases, salts, and other substances on the hydration capacity of prepared colloidal bodies and masses of vegetable cells. In a previous paper[11] he had reported that 0.01 N hydroxides retard the hydration of colloids, and suggested that the chief function of the base forming metals required by plants might be the restricting or limiting of the hydration capacity of the living protoplasm. He now finds that when concentrations of 0.001 to 0.0001 M solutions of chlorides and nitrates, and 0.001 to 0.0001 N hydroxides are used, concentrations comparable to those occurring in living cells, the hydration is increased and not restricted. He therefore reinterprets the function of the metallic elements as accelerators of hydration and growth. Correction is also made regarding the effects of HCl. At a P_H value of 4.2 the acid is now shown to cause more swelling than water. Some interesting studies of the hydration of roots of different ecological types, and of roots grown in different types of soil are reported. In general he concludes that all substances which are known to facilitate growth in plants will at appropriate concentrations increase the hydration capacitv in some of the colloidal objects tested.—C. A. SHULL.

Vertical distribution of Fucus.—*Fucus* has long been regarded as characteristic of the zone of tidal play, largely because of its high light requirement

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[8] McKAY, B. M., Transmission of some wilt diseases in seed potatoes. Jour. Agric. Res. **21**:821–847. 1921.

[9] MACDOUGAL, D. T., Water deficit and the action of vitamines, amino-compounds, and salts on hydration. Amer. Jour. Bot. **8**:296–302. 1921.

[10] ———, The action of bases and salts on biocolloids and cell masses. Proc. Amer. Phil. Soc. **60**:15–30. 1921.

[11] ———, Growth in organisms. Science **49**:599–605. 1919.

and its capacity for exposure to the air. GAIL has made some exact studies to determine the controlling factors in distribution.[12] High light requirement is well shown by the fact that the average vertical distance occupied by *Fucus* on south slopes is over 2 m., while on north slopes it is less than one-third of a meter. North exposures with a high shore line have no *Fucus* at all, and there is little or no *Fucus* under overhanging trees. Careful experimental study showed that mature *Fucus* plants are more resistant to low light intensities than are sporelings, that reduced light intensities cause the death of well grown *Fucus* plants 1 m. below the water surface, and that reduced light causes the death of oospores and sporelings when planted more than 3 dm. below the water surface. Well grown *Fucus* plants receiving less than one-fourth total light become darker in color, and decomposition takes place. From these considerations it is properly concluded that light is a controlling factor in determining the lower limit of *Fucus*.—H. C. COWLES.

Vegetation of the Dry Tortugas.—The Tortugas are the westernmost of the Florida keys, and are the seat of a marine laboratory of the Carnegie Institution. While engaged in other work, BOWMAN took occasion to make a detailed study of the distribution and special ecology of the vegetation of the Dry Tortugas.[13] After brief statements on the geology and the climatic conditions, the author presents a general sketch of the vegetation, which speaking broadly belongs entirely to the strand flora. Even *Rhizophora* is lacking in the sense of an association, because of the xerophytism of the conditions. Four communities are recognized, dominated respectively by *Uniola paniculata*, *Suriana maritima*, *Opuntia Dillenii*, and *Chamaesyce buxifolia*. A detailed account then follows of the special vegetation of each of the eight keys that make up the group. Of especial interest is the author's comparison of the vegetation of the islands in 1915 and 1916 with their vegetation in 1904, as reported by LANSING.—H. C. COWLES.

Scrophulariaceae and Orobanchaceae.—BOESHORE[14] has reached the conclusion that the Orobanchaceae represent an extreme offshoot from the Scrophulariaceae. This conclusion is based upon a detailed study of the roots, stems, leaves, flowers, and seeds of both families. From a review of these details, the author concludes that there is ample evidence "to show that direct and distinct continuity can be established from non-parasitic througn semi-parasitic Scrophulariaceae to the most degraded parasites of the family, and that these again show direct continuity with the still more degraded

[12] GAIL, FLOYD W., Some experiments with *Fucus* to determine the factors controlling its vertical distribution. Publ. Puget Sound Biol. Sta. **2**:139–151. 1918.

[13] BOWMAN, H. H. M., Botanical ecology of the Dry Tortugas. Carnegie Inst. Washington Publ. **252**:109–138. *pls. 6. figs. 7.* 1918.

[14] BOESHORE, I., The morphological continuity of Scrophulariaceae and Orobanchaceae. Contrib. Bot. Lab. Univ. Penn. **5**:139–177. *pls. 12–16.* 1920.